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10/537,738

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EXAMINER

TESKIN, FRED M

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/537,738	Applicant(s) MORALES-BALADO ET AL.	
	Examiner Fred M. Teskin	Art Unit 1796	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-33 is/are pending in the application.
4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-33 is/are rejected.
- 7) ☒ Claim(s) 4, 21 and 29 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08 June 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>20060323</u> . | 6) <input type="checkbox"/> Other: ____. |

Claims 1-33 are currently pending and under examination herein.

The disclosure is objected to because of the following informalities: at page 6, line 7, "metacrylic" presumably should read --methacrylic-- (*cf.*, claim 12, final line) and at page 8, line 9, the expression "(8\$% ...)" is not understood. Appropriate correction of the specification is required.

Claims 4, 21 and 29 are objected to because of the following informalities: Claims 4 and 21 each recite a general formula that contains unbalanced parentheses (see claim 4, line 4 and claim 21, line 3 and *cf.*, Specification page 5, line 10). In claim 29, the term "metacrylic" should be corrected as noted above. Appropriate correction is required.

Claims 1-33 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. More specifically, the following grounds for indefiniteness apply to the indicated claims.

(A) The expression "alkadiene (conjugated diene)" in claims 1 and 17 creates indefiniteness as it is unclear whether "conjugated diene" is to be read as restrictive to "alkadiene" or merely exemplary thereof. If merely exemplary, the parenthetical term is superfluous and should be deleted. As the claims are now drafted, the presence of "(conjugated diene)" causes confusion as to the scope of the claims.

(B) Claims 4 and 21 provide the limitation to “the coupling agent”. There is insufficient antecedent basis for this limitation in the claims.

(C) Claims 5 and 22 are ambiguous in the recitation “composition ... may be totally or partially hydrogenated”. It is unclear, given the “may be” language, whether a hydrogenated composition is an essential feature of the claim. If merely optional, it is not seen wherein claims 5 and 22 further limit the subject matter of claims 4 and 21, respectively. Clarification and appropriate correction are required.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-7 and 9-16 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over either of US 5705569 (Moczygemba) or US 6235847 (Hoshi).

Moczygemba discloses resinous monovinylarene-conjugated diene block copolymer characterized by a polymodal character such that the monovinylarene blocks comprise different molecular weight species (see col. 4, lines 38+ col. 8, lines 35-43).

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Table 14 details a four step, sequential polymerization under the first embodiment of Moczygemba; varying amounts of styrene are polymerized in each of steps 1-3 and GPC data is presented reflecting different peak molecular weights for the corresponding polymer blocks. A polydispersity within the interval of 1.01 to 4 as per claim 1 hereof is not reported; however, it is noted the monovinylarene blocks were prepared by varying the amount of n-butyllithium initiator in each of the corresponding monovinylarene charges added during a batch polymerization procedure as described in the working examples of Moczygemba (see, e.g., Example I in cols. 15-16). It is stated that by varying the amounts of initiator in each of the charges having initiator, the differences in molecular weights of the monovinylarene components resulting from each of these charges can be increased (col. 9, lines 40-48). The applicants' block copolymer is similarly obtained, i.e., by batch anionic polymerization using controlled additions of the initiator or the terminating agent or the coupling agent (Specification, p. 7, lines 4+). Because Moczygemba teaches a similar polymerization procedure to applicants', a plausible basis exists to infer that the monovinylarene block of the resultant block copolymer will intrinsically possess a polydispersity within the interval claimed.

Hoshi discloses a linear block copolymer comprising at least two vinyl aromatic hydrocarbon blocks (S), at least two conjugated diene blocks (B) and at least one vinyl aromatic hydrocarbon/conjugated diene copolymer block (B/S), and wherein both terminal blocks of the linear block copolymer are S blocks and both terminal S blocks in total comprise at least two fractions having different peak molecular weights (col. 2, lines 35+). Production of linear block copolymer having a S1-B1-B/S-B2-S2 block

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configuration and a bimodal molecular weight distribution is demonstrated (see col. 14, lines 10-15 and Table 1). As an exemplary polymerization method, Hoshi teaches adding in the course of the polymerization reaction of vinyl aromatic hydrocarbon monomers for forming the terminal blocks, a deactivating agent to the polymerization system to deactivate a part of the polymerization initiator, thereby terminating the polymerization reaction of a part of molecular chains, and then adding again vinyl aromatic hydrocarbon monomer to the reaction system to continue the polymerization reaction of the remaining part of molecular chains for forming fresh additional terminal blocks, thereby producing a plurality of fractions having different peak molecular weights (col. 7, lines 4-20). The applicants' block copolymer, as noted above, is similarly prepared, as by using controlled additions of terminating agent during batch anionic polymerization. Thus, although not explicitly disclosed by Hoshi, a polydispersity within the interval recited in claim 1 is reasonably presumed inherent, given the similarity in polymerization conditions used to prepare the block copolymer of Hoshi and the applicants' composition. Where the claimed and prior art products are identical or substantially identical, or are produced by identical or substantially identical processes, a *prima facie* case of either anticipation or obviousness is established. *In re Best*, 195 USPQ 430, 433 (CCPA 1977). When there is sound basis for believing that the products of the applicant and the prior art are the same, the applicant has the burden of showing that they are not. *In re Spada*, 15 USPQ2d 1655, 1658 (Fed. Cir. 1990).

Claims 1-3, 6, 7 and 9-15 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over US 5229472 (Binsbergen).

Binsbergen describes a series of anionic polymerizations styrene in an extruder to produce polystyrenes characterized by M_w/M_n values corresponding to polydispersities within the interval recited in claim 1 (see Illustrative Embodiments I - XII and Tables I and II in col. 4). Binsbergen then describes (Illustrative Embodiments XIII-XVI and Table III) production of block copolymers of styrene and isoprene under conditions closely similar to those employed in the styrene polymerizations, i.e., rate of styrene introduction to the extruder of approximately 3.5 kg/hr, sec-butyllithium:styrene ratio of 0.7 g/kg and screw speed of 200 rpm (*cf.*, col. 4, lines 33-34, 50-53 and Table II). Thus, although Binsbergen does not give polydispersity values for the styrene blocks, it reasonable to infer from the similar polymerization procedures, that the styrene blocks of the disclosed block copolymers will intrinsically possess similar molecular weight parameters, including similar polydispersities, to those reported for the polystyrene products. And since all the M_w/M_n values reported by Binsbergen fall within the claimed interval of 1.01 to 4, it is concluded that the similarly prepared styrene-isoprene block copolymers inherently anticipate applicants' composition as defined in claims 1-3, 6, 7 and 9-14. Further as to claim 15, Binsbergen's generic teaching identifying butadiene and isoprene as particularly preferred alkadienes (col. 2, lines 38-40) would have rendered obvious to one of ordinary skill in the art a block copolymer composition based on 1,3-butadiene, as claimed.

Claims 17 and 19-33 are rejected under 35 U.S.C. 102(b) as being anticipated by EP 0879836.

EP '936 discloses an aromatic vinyl-conjugated diene block copolymer wherein the aromatic vinyl block segment is characterized by a peak top molecular weight in a molecular weight distribution curve (GPC) of 80,000 to 300,000 and the proportion of block vinyl aromatic block segments having a molecular weight of at most a third of the peak top molecular weight in the molecular weight distribution curve of the aromatic vinyl block segment is 30 to 90 mol % based on the total content of that segment (page 3). Table 1 describes styrene-butadiene block copolymers characterized by specific proportions of portions of the styrene block segment which have a molecular weight of at most 1/3 of the peak top molecular weight given for the block styrene segment. Because different portions of the styrene block segments possess different molecular weights, the described block copolymers are seen to comprise a block of "polydisperse vinyl aromatic compound" as per claim 17. Furthermore, EP '936 teaches in Example 6 to combine 180 g of block copolymer (A) from Table 1 with 1,820 g of styrene monomer to form an impact resistant composition (see page 13). The reported amounts of block copolymer and styrene monomer equate to weight percentages within the claimed ranges, i.e., 91 % in weight styrene monomer and 9 % in weight of the block copolymer (A) (corresponding to the claimed impact-modifier). Further, based on the values of bound styrene content and M_p as reported in Table 1, the block copolymer (A) is seen to meet the claim limitations as to B/S ratio and molecular weights (*cf.*, claims 19-28).

The prior art made of record and not relied upon is considered pertinent to applicants' disclosure. Kitchen is cited as pertinent to polymodal block copolymers of butadiene and styrene (note Examples VII-VIII in cols. 21-24).

Claims 8 and 18 would be allowable if amended or rewritten to overcome the rejection under 35 U.S.C. 112 set forth in this Office action and to include all the limitations of the base claim and any intervening claim.

Any inquiry concerning this communication should be directed to Examiner F. M. Teskin whose telephone number is (571) 272-1116. The examiner can normally be reached on Monday through Thursday from 7:00 AM - 4:30 PM, and can also be reached on alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wu, can be reached on (571) 272-1114. The appropriate fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Fred M Teskin/

Primary Examiner, Art Unit 1796

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